

From the  
INTERNATIONAL SEARCHING AUTHORITY

Rec'd PCT/PTO 08 JUN 2005

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY  
(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/JP2004/002046

International filing date (day/month/year)  
20.02.2004

Priority date (day/month/year)  
24.02.2003

International Patent Classification (IPC) or both national classification and IPC  
G11B7/007, G11B7/24

Applicant  
RICOH COMPANY, LTD.

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**Box No. I Basis of the opinion**

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. **type of material:**
    - a sequence listing
    - table(s) related to the sequence listing
  - b. **format of material:**
    - in written format
    - in computer readable form
  - c. **time of filing/furnishing:**
    - contained in the international application as filed.
    - filed together with the international application in computer readable form.
    - furnished subsequently to this Authority for the purposes of search.
3.  In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

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**Box No. II Priority**

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1.  The following document has not been furnished:

- copy of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(a)).
- translation of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2.  This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

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**Box No. IV Lack of unity of invention**

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1.  In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has:

- paid additional fees.
- paid additional fees under protest.
- not paid additional fees.

2.  This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

- complied with
- not complied with for the following reasons:

**see separate sheet**

4. Consequently, this report has been established in respect of the following parts of the international application:

- all parts.
- the parts relating to claims Nos. 1-4

**WRITTEN OPINION OF THE  
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PCT/JP2004/002046

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or  
industrial applicability; citations and explanations supporting such statement**

**1. Statement**

|                               |      |        |     |
|-------------------------------|------|--------|-----|
| Novelty (N)                   | Yes: | Claims | 1-4 |
|                               | No:  | Claims |     |
| Inventive step (IS)           | Yes: | Claims |     |
|                               | No:  | Claims | 1-4 |
| Industrial applicability (IA) | Yes: | Claims | 1-4 |
|                               | No:  | Claims |     |

**2. Citations and explanations**

**see separate sheet**

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/JP04/02046

**Re Item IV**

**Lack of unity of invention**

This Authority considers that there are 2 inventions covered by the claims indicated as follows:

- I: Claims 1-4 directed to a medium for optical recording comprising cells of equal size and varying pit-occupancy rates
- II: Claims 5-12 directed to an apparatus for optical information processing

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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)**

International application No.

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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)**

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The reasons for which the inventions are not so linked as to form a single general inventive concept, as required by Rule 13.1 PCT, are as follows:

Invention I and II each relate to optical information recording based on pits which is considered to be a well-known technology. The additional features disclosed in invention I and II respectively establish no technical relationship.

In conclusion, the groups of claims are not linked by common or corresponding special technical features and define 2 different inventions not linked by a single general inventive concept.

The application, hence does not meet the requirements of unity of invention as defined in Rules 13.1 and 13.2 PCT.

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/JP04/02046

1. Reference is made to the following documents:

D1: US-A-5 757 763 (GREEN JR THOMAS J ET AL) 26 May 1998 (1998-05-26)  
D2: US-B1-6 175 548 (KASHIWAGI TOSHIYUKI) 16 January 2001 (2001-01-16)  
D3: EP-A-1 197 963 (TDK CORP) 17 April 2002 (2002-04-17)

2. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1-4 does not involve an inventive step in the sense of Article 33(3) PCT.
3. As for claim 1 the document D1 is regarded as being the closest prior art, and discloses (the references in parentheses applying to this document) a medium for optical recording, from which recorded information is reproduced by a laser beam (128), comprising: a disk board having a recording surface (122), and a plurality of pits (125) in the recording surface, wherein each of said pits is comprised in a corresponding one of a plurality of cells each cell having equal size and varying pit-occupancy rates dependent on the recorded information (fig 12 shows equally spaced pits of different size, thus there is a constant cell size with varying pit-occupancy rates), said pit-occupancy rate being the ratio of area of said pit to area of said cell corresponding to said pit (D1 col 7 l 16- col 8 l 5; fig 12).

The subject-matter of claim 1 therefore differs from the disclosure of D1 in that the depths H of said pits, a wavelength  $\lambda$  of the laser beam, and a refractive index n of said board are related as:

$$\lambda/6n < H < \lambda/4n.$$

The problem to be solved by the present invention may therefore be regarded as to provide a range for the depth of the pits where a good modulation degree of the read signal and a good push-pull signal for the tracking error server is achieved.

Document D2 proposes for this purpose (D2 col 5 l 37-51) that the depths H of the pits, a wavelength  $\lambda$  of the laser beam, and a refractive index n of said board are related as:  $\lambda/8n < H < \lambda/4n.$

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The solution proposed in claim 1 of the present application can therefore not be considered as involving an inventive step (Article 33(3) PCT).

4. As for dependent claim 2 the feature of pits being comprised in central positions of said corresponding cells in substantially circular patterns having different radii is described in document D3 (par 27-39; in particular pits 48A, 48B, 48D, 48E, 48G shown in fig 3) as providing the same advantages as in the present application. The skilled person would therefore regard it as a normal design option to include this feature in the optical recording medium described in document D1 in order to solve the problem posed.

The subject-matter of claim 2 of the present application can therefore not be considered as involving an inventive step (Article 33(3) PCT).

5. As for dependent claims 3 and 4 the additional features stipulated here are known from D1 (col 5 l 45-62; fig 8).

The subject-matter of claims 3 and 4 of the present application can therefore not be considered as involving an inventive step (Article 33(3) PCT).